What is claimed is:

1. A phototransistor, comprising:

an emitter comprising antimony;

a base comprising antimony, said base comprising an emitter-contacting portion which is in contact with a base-contacting portion of said emitter; and

a collector comprising antimony, said collector comprising a base-contacting portion which is in contact with a collector-contacting portion of said base,

said phototransistor producing an internal gain upon being contacted with light within a receivable wavelength range.

2. A phototransistor as recited in claim 1, wherein said emitter, said base and said collector are each substantially lattice-matched.

3. A phototransistor as recited in claim 1, wherein said emitter comprises at least one material selected from the group consisting of AlInGaAsSb, AlGaAsSb, InGaAsSb, AlGaSb and GaSb.

4. A phototransistor as recited in claim 1, wherein said base comprises AlInGaAsSb, AlGaAsSb, InGaAsSb, AlGaSb and GaSb.

5. A phototransistor as recited in claim 1, wherein said collector comprises AlInGaAsSb, AlGaAsSb, InGaAsSb, AlGaSb and GaSb.

6. A phototransistor as recited in claim 1, wherein said base comprises a bandgap gradient defined between said emitter-contacting portion and said collector-contacting portion thereof, said base bandgap gradient comprising a plurality of base bandgap values that decrease in a direction away from said emitter-contacting portion and toward said collector-contacting portion.

7. A phototransistor as recited in claim 6, wherein a bandgap value at said base-contacting portion of said emitter is greater than or substantially equal to a bandgap value at

said emitter-contacting portion of said base, and wherein a bandgap value at said base-contacting portion of said collector is less than or substantially equal to a bandgap value at said collector-contacting portion of said base.

8. The phototransistor according to claim 7, wherein said bandgap value at said base-contacting portion of said emitter is greater than said bandgap value at said emitter-contacting portion of said base.

9. The phototransistor according to claim 7, wherein said bandgap value at said base-contacting portion of said collector is less than said bandgap value at said collector-contacting portion of said base.

10. A phototransistor as recited in claim 1, wherein said base comprises at least a first base layer and a second base layer, said first base layer including said emitter-contacting portion and comprising a first band gap value, said second base layer including said collector-contacting portion and comprising a second bandgap value, said first bandgap value being greater than said second bandgap value.

11. A phototransistor as recited in claim 10, wherein said first base layer consists essentially of at least one material selected from the group consisting of AlGaAsSb and AlInGaAsSb.

12. A phototransistor as recited in claim 10, wherein said second base layer consists essentially of InGaAsSb.

13. A phototransistor as recited in claim 10, wherein said emitter comprises a bandgap value which is larger than or substantially equal to said first bandgap value.

14. A phototransistor as recited in claim 10, wherein said collector comprises a bandgap value which is less than or substantially equal to said second bandgap value.

15. A phototransistor as recited in claim 1, wherein said emitter comprises an emitter bandgap value, said base comprises a base bandgap value and said collector comprises a collector bandgap value, wherein said emitter bandgap value is greater than or substantially equal to said base bandgap value, and wherein said base bandgap value is greater than or substantially equal to said collector bandgap value.

16. A phototransistor as recited in claim 15, wherein said emitter bandgap value is greater than said base bandgap value.

17. A phototransistor as recited in claim 16, wherein said base bandgap value is substantially equal to said collector bandgap value.

18. A phototransistor as recited in claim 16, wherein said collector bandgap value is greater than said base bandgap value

19. A phototransistor as recited in claim 1, wherein said emitter-contacting portion of said base comprises a first bandgap value and said base-contacting portion of said emitter comprises a second bandgap value, said first bandgap value being less than said second bandgap value.

20. A phototransistor as recited in claim 19, wherein said collector-contacting portion of said base has a third bandgap value, said second bandgap value being less than said third bandgap value.

21. A phototransistor as recited in claim 19, wherein said collector-contacting portion of said base has a third bandgap value, said second bandgap value being substantially equal to said third bandgap value.

22. A phototransistor as recited in claim 19, wherein said collector-contacting portion of said base has a third bandgap value, said second bandgap value being greater than said third bandgap value.

23. A phototransistor as recited in claim 1, further comprising a substrate.

24. A phototransistor as recited in claim 23, wherein said substrate comprises antimony.

25. A phototransistor as recited in claim 24, wherein said substrate consists essentially of GaSb or InGaSb.

26. A phototransistor as recited in claim 23, wherein said substrate, said collector, said base and said emitter are substantially lattice matched.

27. A phototransistor as recited in claim 1, wherein said emitter, said base and said collector together comprise an n-p-n transistor.

28. A phototransistor as recited in claim 1, wherein said emitter, said base and said collector together comprise a p-n-p transistor.

29. A phototransistor as recited in claim 1, wherein said receivable wavelength range is from 1.8 micrometers to 2.5 micrometers.

30. A phototransistor that produces an internal gain upon being contacted with light within a receivable wavelength range, said phototransistor comprising:

a substrate comprising antimony;

a collector comprising antimony, said collector comprising a substrate-contacting portion which is in contact with a collector-contacting portion of said substrate;

a base comprising antimony, said base comprising a collector-contacting portion which is in contact with a base-contacting portion of said collector; and

an emitter comprising antimony, said emitter comprising a base-contacting portion which is in contact with an emitter-contacting portion of said base;

wherein said substrate, said collector, said base and said emitter are each substantially lattice matched.

31. A phototransistor that produces an internal gain upon being contacted with light within a receivable wavelength range, said phototransistor comprising:

a substrate comprising antimony;

a collector comprising antimony, said collector comprising a substrate-contacting portion which is in contact with a collector-contacting portion of said substrate;

a base comprising antimony, said base comprising a collector-contacting portion which is in contact with a base-contacting portion of said collector; and

an emitter comprising antimony, said emitter comprising a base-contacting portion which is in contact with an emitter-contacting portion of said base, said phototransistor being formed by a method comprising:

forming said collector on said substrate using a process such that said collector is substantially lattice matched to said substrate;

forming said base on said collector using a process such that said base is substantially lattice matched to said collector; and

forming said emitter on said base using a process such that said emitter is substantially lattice matched to said base.

32. A phototransistor as recited in claim 31, wherein said process comprises at least one process selected from the group consisting of liquid phase epitaxy processes, molecular beam epitaxy processes, and metal-organic chemical vapor deposition processes.

33. A method of forming a phototransistor that produces an internal gain upon being contacted with light within a receivable wavelength range, said method comprising:

forming a collector comprising antimony on a substrate comprising antimony using a process such that said collector is substantially lattice matched to said substrate;

forming a base comprising antimony and having a collector-contacting portion in contact with a base-contacting portion of said collector using a process such that said base is substantially lattice matched to said collector; and

forming an emitter comprising antimony and having a base-contacting portion in contact with an emitter-contacting portion of said base using a process such that said emitter is substantially lattice matched to said base.

34. A method as recited in claim 33, wherein said process comprises at least one process selected from the group consisting of liquid phase epitaxy processes, molecular beam epitaxy processes, and metal-organic chemical vapor deposition processes.

35. A method as recited in claim 33, further comprising:

forming a buffer layer comprising antimony on said substrate such that said buffer layer is positioned between said substrate and said collector.

36. A method as recited in claim 33, further comprising:

forming a contact layer comprising antimony on a portion of said emitter opposite said base-contacting portion of said emitter.

37. A method as recited in claim 36, further comprising forming a first conductive member on a portion of said contact layer opposite an emitter-contacting portion of said contact layer and forming a second conductive member on a portion of said substrate opposite said portion of said substrate on which said buffer layer is formed.

38. A method as recited in claim 37, further comprising forming a third conductive member in contact with said base.

39. A method as recited in claim 33, further comprising forming a first conductive member on a portion of said emitter opposite said base-contacting portion of said emitter and forming a second conductive member on a portion of said substrate opposite said portion of said substrate on which said collector is formed.

40. A method as recited in claim 39, further comprising forming a third conductive member in contact with a portion of said base.

41. A method as recited in claim 33, wherein said forming said base comprises forming a bandgap gradient which increases from said collector-contacting portion of said base toward said emitter-contacting portion of said base.

42. A method as recited in claim 33, wherein said forming said base comprises forming a second base layer in contact with said collector and forming a first base layer in contact with said second base layer, said first base layer including said emitter-contacting portion and comprising a first band gap value, said second base layer including said collector-contacting portion and comprising a second bandgap value, said first bandgap value being greater than said second bandgap value.

43. A method as recited in claim 33, wherein said substrate comprises GaSb.

44. A method as recited in claim 33, wherein said collector comprises InGaAsSb.

45. A method as recited in claim 33, wherein said base comprises at least one of AlGaAsSb and InGaAsSb.

46. A method as recited in claim 33, wherein said emitter comprises AlGaAsSb.

47. A method as recited in claim 42, wherein said first base layer comprises AlGaAsSb and said second base layer comprises InGaAsSb.

48. A method of detecting light, comprising contacting a phototransistor as recited in claim 1 with light comprising at least a first wavelength, said first wavelength falling within said receivable wavelength range, and applying a current through said phototransistor, said current being amplified as a result of said light contacting said phototransistor.

49. A method as recited in claim 48, wherein said light comprises infrared light.